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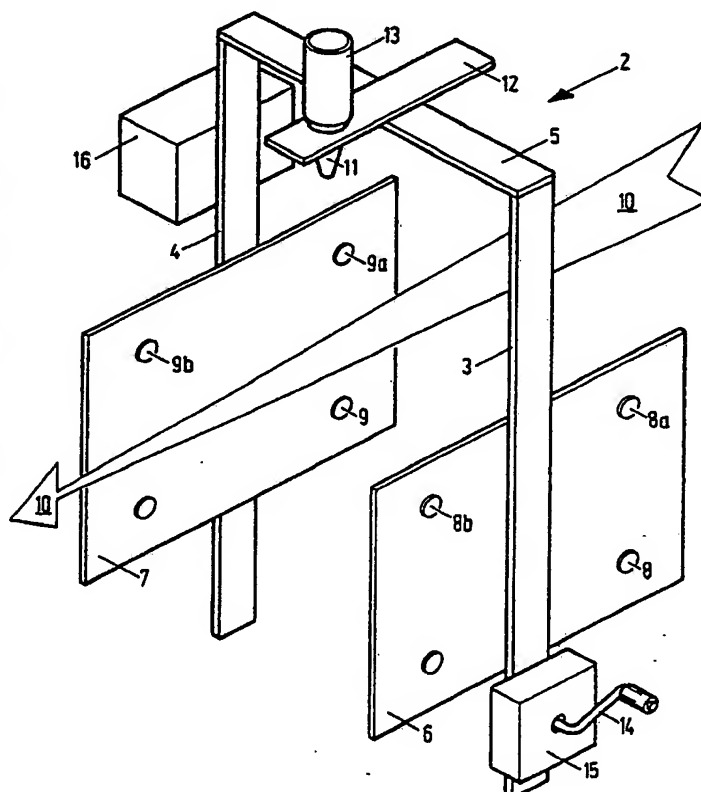
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(54) Title: METHOD AND APPARATUS FOR IDENTIFYING AND/OR DISPENSING MEDICINAL TREATMENT IN
THE FORM OF A SUBSTANCE, SUCH AS POWDER, PASTE OR LIQUID, TO A WILD ANIMAL

(57) Abstract

The invention relates to a method and an apparatus for dispensing powder, paste or liquid on an animal for the prevention or cure of illnesses. The apparatus comprises measuring devices (8, 9) to measure data about the animal, as the animal passes between two poles (3, 4) or trees on opposite sides of a path leading to and from the watering or feeding place of the animal. The data measured are transmitted to a controlling device (16), which on the basis of said data can cause for example a magnetic valve to open, said magnetic valve being positioned at an exhaust nozzle (11) of a pressure-proof container (13) containing the particular substance and may be put under pressure by for example a bicycle pump. The exhaust nozzle (11) is mounted above the established passage on an overhanging arm between the poles (3, 4) or a branch of a tree. The data comprise the height, length, weight and direction of movement of the animal, and the controlling device (16) comprises time delay devices.



**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. PCT/DK 89/00310**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 2190574	87-11-25	NONE	
US-A- 2665665	54-01-12	NONE	
US-A- 3884192	75-05-20	NONE	

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METHOD AND APPARATUS FOR IDENTIFYING AND/OR DISPENSING
MEDICINAL TREATMENT IN THE FORM OF A SUBSTANCE, SUCH AS
POWDER, PASTE OR LIQUID, TO A WILD ANIMAL

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The invention relates to a method for identifying and/or dispensing medicinal treatment in the form of a substance, such as powder, paste or liquid, to a wild animal, for example deer or wild boar, by means of an apparatus comprising a gallows with a passage.

10

Domestic as well as wild animals are exposed to illnesses caused by parasites. These illnesses weaken the animals, causing loss of income by cattle-breeding with domestic animals such as cows and pigs, and reduced yield by deer and wild boar hunting or by breeding of similar wild animals.

15

By breeding of domestic animals, such as cows, sheep, goats, pigs or hens it is necessary, in order to prevent the animals from illnesses or to cure illnesses and thus prevent the mentioned loss of income, to use various drugs or antibiotics administered in the form of pills or by innoculation under the skin of the animal.

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This can be effected comparatively easy by domestic animal breeding, although the dispensing of the drugs involves staff related expenditures for qualified administration of the drugs.

30

In order to reduce the costs related to cattle breeding apparatuses for automatic dispensing of pills to domestic animals have been conceived. An apparatus of this type is known for example from US Patent Specification No.

4.617.876, wherein cows are provided with ear tags with a code for information about the particular cow. As the cow enters the stable the ear tag is also designed to activate a receiving device to read data relating to the cow, whereupon the receiving device will activate a controlling device to dispense the correct feed ration to the cow according to a preestablished feed plan, possibly also comprising drugs to be administered to the cow together with the feed ration. In addition, the controlling device comprises a memory to record, store and possibly later pass on the data recorded about the particular cow during its feeding. These data may comprise the weight of the animal, the platform in the stalls having been provided with weight signals. The controlling device is also designed after the feeding to direct the animal back to continued grazing outdoors or to direct the animal into a separate pen, and to be taken from there to be milked, to be bred or to be slaughtered.

20 An apparatus of this description is not suitable for identification and/or medicinal treatment of wild animals.

In the case of wild animals, such as deer and wild boar, a necessary prerequisite for use of the known apparatus would be to catch the wild animals in order to ear tag them, and during this confinement to record the various data relating to the animal into the ear tag before attaching it to the animal.

30 This can be effected in various ways. In case the wild animals are fenced in, they may be driven into a funnel shaped pen and caught with a rope, or a net may be thrown over the wild animal in order to secure it to such an extent as circumstances may require.

Experience shows, however, that wild animals which are trapped this way, will often react so violently that they may hurt themselves.

5

Another possibility of trapping the animals may be effected by means of injection arrows containing anaesthetics, which will cause unconsciousness of the animal during the attachment of the ear tag. Injection
10 arrows are rather costly in use, as an example a single shot with a injection arrow may cost between 800 and 1200 DKK.

In the case of the first mentioned method it was possible
15 to mark the particular animals, at the same time administering the drugs so that it was possible to distinguish them from the untreated animals. In the case of the latter method this has not been possible, and know-
20 ing the untreated animals from the animals already treated was solely a question of the ability of the particular handler to distinguish the animals from one another.

Finally, it would be impossible to make the extremely shy deer move into this known apparatus, which is an ordinary
25 stable with stalls.

In recent years, means have been available in domestic animal breeding to ward off some the mentioned diseases, and said means have consisted of drugs to be inoculated
30 or rubbed into the skin of the particular animal, whereupon the drug would pass into the animal and thus parry off certain parasites, such as intestinal worms, etc. In order to administer these drugs in an inexpensive way, an apparatus has been provided as described in DE Printed

Specification no. 22 44 669. This known apparatus comprises a gallows or a gate opening, constituting a kind of passage, provided at each end with wings, which can be pushed aside by an animal, as the animal is driven through the passage. When the animal is between the front and rear wings in the direction of movement, the drug desired can be administered onto the animal so that it may be cured. By this known apparatus it is therefore necessary to select the animals to be treated beforehand and subsequently drive them through the apparatus one by one.

This is not possible in the case of wild animals such as deer, which will not be tamed nor driven through an apparatus of the type described, wherein they must press the wings aside with head and body.

It is an object of this invention to provide a method for identification and/or medicinal treatment of wild animals, such as deer or wild boar, a method which is considerably less costly than the methods known so far and without the drawbacks described in the known apparatuses, whereby the treatment can be effected automatically, without constant staff supervision or interference.

This object is achieved by the method according to the invention, which is advantageous in that the gallows is positioned above a track used by the animal, that measuring devices adapted to measure data about the animal and its movement through the gallows are placed in the passage, and that a controlling device is connected to the measuring devices, said controlling device being adapted to blow or spray out the substance through a nozzle onto the back of the wild animal on the basis of the mentioned data.

By following this course of action it is possible to effect automatic dispensing of medicine on the individual wild animals without interference by human hands, the apparatus for the wild animals having been positioned above a track which the animals will naturally follow on their way between their feeding and watering places.

By using the measuring devices to determine the height, length, direction of movement and weight of the animal, as described in claim 2, and having the controlling device control the amount of substance blown or sprayed out according to the data measured, it is achieved that the amount of substance is adapted to the size of the animal, and that the drug is blown or sprayed out only as the animal moves through the passage in the direction of movement intended, which means that the drug is not blown or sprayed out in case the animal moves in the opposite direction.

The data measured can also be used to decide whether the animal has been treated within an appropriate period of time prior to its present passage so that the animal is not treated again, or whether the time has extended beyond this period, requiring a new inoculation of the animal.

The invention also relates to an apparatus of the type described in the initial part of claim 3 for use in connection with the implementation of the method mentioned, said apparatus being characteristic according to the invention in that measuring devices have been placed in the passage adapted to measure data about the animal and its movement through the gallows, whereby the gallows is provided with a controlling device connected to

the measuring devices adapted to blow or spray the drug onto the back of the wild animal on the basis of the data measured.

5 A suitable apparatus has hereby been provided for use in the implementation of the method, without unnecessarily frightening the animal and without the drug getting into the eyes of the animal causing possible irritation.

10 The invention will be explained in detail below with reference to the drawing, which shows a schematic embodiment of an apparatus for use in the implementation of the method according to the invention.

15 The apparatus may consist of a gallows 2, which may for example be provided with two upright poles 3, 4, connected by an overhanging arm 5, whereby a gate opening or passage has been created, through which an animal can pass.

20 The apparatus may also consist of naturally occurring objects such as two trees on opposite sides of a path, which wild animals will follow on the way to and from a watering and/or feeding place, and said trees may be utilized as
25 the upright poles 3, 4, the overhanging arm possibly being constituted by a branch of one of the trees positioned at reasonable height above the path.

30 The poles 3, 4 are mounted with a plate 6 respectively 7 facing each other, said plates being provided with measuring devices adapted to detect the passage of an animal between the plates.

The measuring devices may for example be light sources 8

mounted on the plate 6, said light sources emitting visible or invisible light against photocells 9 placed on the plate 7.

5 As an animal passes between the two plates 6 and 7, the body of the animal will break the beams of light emitted from the light sources 8 against the photocells 9, whereby a signal can be obtained indicating the passage of an animal.

10

A light source 8 may also be incorporated into a photocell 9 to constitute an integral unit, which can be placed on the plate 6, a reflecting material such as a mirror or a similar object which can reflect a beam of light emitted from the light source 8 against the photocell 9, being then placed on the plate 7.

15

It is possible in this way to reduce the volume of conductors of any kind, which can conduct impulses from the photocell 9 to the controlling device 16 described below. The conductors may be electric wires, which can conduct impulses in the form of voltage, light conductor cables, which can conduct impulses in the form of flashes, or other types of conductors.

20

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It is important to be able to determine the direction of passage of an animal through the gallows 2, since in case a single light source 8 and a single photocell 9 are used alone, the drug would be sprayed out in any event without necessarily hitting the back of the animal; it may for example be blown out over the head of the animal which could be unpleasant, or it may possibly even harm the animal if the particular substance is dangerous to the eyes, or the substance could be blown out in front of the

30

animal, whereby the substance would be wasted.

5 In order to determine the direction of movement of an animal, several light sources 8, respectively photocells 9, are positioned at the same height above ground surface, whereby it is possible, on the basis of the beam of light first broken, to determine the direction of movement of the animal.

10 Having thus placed light sources 8a and 8b at the positions shown in the drawing and corresponding photocells 9a and 9b on the plate 7, it is possible to determine that an animal has moved in the direction indicated by the arrow 10, if the beam of light between the
15 light source 8a and the photocell 9a is broken before the beam of light between the light source 8b and the photocell 9b.

20 By using pairs of light sources 8 and photocells 9 positioned at different horizontal heights above ground, it is possible in a similar way to determine the height of the animal and thereby its size. It should be taken into consideration, however, that an animal may walk with its head up or head down, which would give an incorrect im-
25 pression of the size of the animal. This problem may be solved by using a weighing device such as a weighing cell, which is not illustrated in the drawing, and the data of said weighing device, in conjunction with the data recorded by the remaining measuring devices, may serve
30 the purpose of determining the species of the particular animal.

This is important, in case the amount of the particular substance is to be administered in a dose depending upon

size and weight, which is usually proportional to the height of the animal.

Also, different species of animals may pass through the gallows 2. It is possible that deer as well as wild boar will pass through the gallows.

The drawing illustrates a first 8a and a second light source 8b only, but it will be obvious that by placing a total of three light sources 8 at the same horizontal height with corresponding photocells 9 on the opposite plate 7, it will be possible to record the speed of motion, length and height of the animal, which will render it possible, on the basis of the data obtained by experience, to determine the species of animal passing through the passage.

The measuring devices have been described above as being light sources 8, which are able to emit visible or invisible beams of light against photocells 9, to the effect that an impulse will occur as the beams are broken by the passage of an animal.

The above description of the type of measuring devices indicated is not intended as a definition of the limits of the invention, since any type of sensors, which can react to the presence of an animal, can be used instead of the light sources 8 and the photocells 9 mentioned.

A controlling device 16, for example on the upright pole 4, has been mounted in connection with the gallows 2. This controlling device 16 is adapted to receive data indicating that one or more beams of light between the light sources 8 and the photocells 9 have been broken, said con-

trolling device being for example a computer of commonly known type.

5 As the controlling device 16 receives data indicating that an animal is passing, the controlling device is adapted to emit an impulse to a nozzle device, which is not illustrated in the drawing, said device being for example an electrically operated magnetic valve. The impulse will cause a discharge nozzle 11 to open, which may be placed
10 on the overhanging arm 5 or on a beam 12 extending in the longitudinal direction of the passage and secured to the overhanging arm 5.

15 The controlling device 16 is provided with time delay devices, which are adapted to delay the impulse emitted to the magnetic valve for such duration of time that the exhaust nozzle 11 will dispense the particular substance, exactly as the back of the animal is below the nozzle 11. This time delay must also be made to depend upon the
20 speed of motion of the animal through the gallows possibly predetermined by the measuring devices 8, 9 and the controlling device 16, and the duration of open time of the magnetic valve should be related to the possible speed of motion of the animal.

25 The exhaust nozzle 11 is connected to a pressure-proof container 13 positioned on the overhanging arm 5 or on the beam 12. The container 13 is adapted to contain an appropriate portion of the substance, which is to be
30 administered to the animals to be treated. The pressure-proof container 13 is adapted to be put under pressure by means of a pressure exerting device 14, which may for example be a manually operated pump with a handle 15 or an ordinary bicycle pump.

It is hereby possible, at suitable intervals, to put the container 13 under appropriate interior pressure by means of the pumping device 14 and the handle 15 in order that
5 the substance contained in the container 13 may be blown out through the nozzle 11, irrespective of the substance being a powder, paste or liquid.

By using a manually operated pumping device 14, the need
10 for proper sources of power such as voltage is avoided on the spot where the gallows has been placed, since it will frequently be placed where voltage is not immediately available.

Contrary hereto, the controlling device 15, the light
15 sources 8 and the photocells 9 may be designed with such low power requirements that they may be power supplied by means of a battery.

The beam 12 placed on the overhanging arm 5 will make it
20 possible to use several exhaust nozzles 11 and several pressure containers 13 to the effect that different substances may be sprayed or blown out. A single substance may be sprayed out only, or perhaps several substances at
25 the same time, depending upon the data measured about the animal.

In addition to the measuring devices in the form of light
30 sources 8 and photocells 9, the measuring devices 8, 9 may comprise means adapted to determine a colour sprayed onto the animal to the effect that the controlling device may receive and record information indicating that the particular substance has been sprayed onto the animal.

Although it has been described above that the animal may be identified by spraying it with a certain colour, it will also be possible to mark it with substances which can identify the animal in a different way, for example by administering a recognizable aromatic substance which is detectable by means of specially adapted sensors.

It is within the frame of the invention to spray out a drug or to mark the animal in such a way that the measuring devices can recognize the particular animal and make it possible by means of a memory built into the controlling device 16 to decide whether the animal will need a new dose.

In order for the animals to become habituated it may be necessary always to dispense some kind of dose. If so, the dose may be completely harmless, possibly comprising a dose of ordinary water, which will merely induce a feeling of an effect produced on the part of the animal.

In addition, the controlling device may be more elaborate to the effect that it may store information about the individual animals having passed through the apparatus, in order that the information may later be read and used for the preparation of statistics about the animals, their number, their passage through the apparatus, the time when the substance was administered, dosage, etc.

C L A I M S

1. Method of identifying and/or dispensing medicinal
5 treatment in the form of a substance such as powder, paste
or liquid, to a wild animal, for example deer or wild
boar, by means of an apparatus comprising a gallows (2)
with a passage (3, 4, 5), c h a r a c t e r i s e d in
10 that the gallows (2) is positioned above a track used by
the animal, that measuring devices (8, 9) adapted to mea-
sure data about the animal and its movement through the
gallows (2) are placed in the passage, and that a con-
trolling device (16) is connected to the measuring devices
15 (8,9) adapted to blow or spray out the substance through a
nozzle onto the back of the wild animal on the basis of
the mentioned data.
2. Method according to claim 1, c h a r a c t e r i s e d
in that the measuring devices (8, 9) are used to determine
20 the height, length, direction of movement and weight of
the animal, and the controlling device (16) are used to
control the amount of substance blown or sprayed out from
the nozzle (11) in accordance with the data measured.
- 25 3. Apparatus for identifying and/or dispensing medicinal
treatment in the form of a substance, such as powder,
paste or liquid, to a wild animal, for example deer or
wild boar, said apparatus being adapted for use in the im-
plementation of the method described in claim 1, and com-
30 prising a gallows (2) with a passage (3, 4, 5), c h a -
r a c t e r i s e d in that measuring devices (8, 9)
have been provided in the passage (3, 4, 5) which are
adapted to measure data about the animal and its movement
through the gallows (2), whereby the gallows (2) is

provided with a controlling device (16) connected to the measuring devices (8, 9), said controlling device being adapted to blow or spray out the substance onto the back of the wild animal through a nozzle (11) on the basis of the data measured.

4. Apparatus according to claim 3, c h a r a c t e -
r i s e d in that the measuring devices (8, 9) are
adapted to measure data about the height, length,
direction of movement and weight of the animal, and that
the controlling device (16) is adapted to control the
amount of substance blown or sprayed out of the nozzle
(11) on the basis of the data measured.

5. Apparatus according to claim 3-4, c h a r a c t e -
r i s e d in that the apparatus has a pressure-proof
container (13) for storage of the drug, whereby the con-
tainer (13) is connected to a pressure increasing device
(14, 15) such as an air pump, preferably a manually
operated air pump, for example a bicycle pump.

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SE,DK,FI,NO classes as above

Category *	Citation of Document, with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
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